

## II THE EVIDENCE OF THE FORGED PRINTING

The following points, developed from intense discussions and even – though short-lived – disagreements between Wilding and Needham, all argue that *SNML* is a forgery. The seventh point is in a higher category for, if it is accurately observed, it establishes physical impossibility that *SNML* was printed from the same setting of movable type as all the other copies. Before reviewing the points, it will be useful to describe *Sidereus nuncius* as a physical object. The first edition of *Sidereus nuncius* is a quarto of 30 leaves. Every copy is made up of seven sheets of paper folded in quarters, signed by the printer A–G. These sheets amount to 28 leaves, but gathering D further contains, sandwiched in the middle of the fold, an additional half-sheet of paper, signed D3.[4]. Thus, the physical structure of the book can be expressed as A–C<sup>4</sup> D<sup>6</sup> E–G<sup>4</sup>. These superscripts imply more than that gathering A has 4 leaves, and so forth. They indicate further that the two leaves A1 and A4 are conjugate with each other, being the two halves, joined at the fold, of a half-sheet of paper; that A2 and A3 are the other half of the same sheet; and that A1 and A2, and A3 and A4, were originally, as the sheets came off the press, all joined together at their top margins, comprising a full sheet of paper. As for the already-mentioned spaces left by the compositors for the eventual introduction of moon etchings, these spaces are on the bottom halves of pages 8r (B4r) and 9v (C1v); on the top half of 10r (C2r); and, with two etchings positioned one above the other (but printed separately, not together), on the otherwise entirely blank page 10v (C2v). On this page 10v, the lower etching is a second impression of the etching already appearing on 10r.

1. *The nature of “shoulder ink” in SNML.* In a few places, most notably at the top line of A4r, there is shoulder ink in *SNML*, as there is, variably, in different places in most or all copies of *Sidereus nuncius*. Typically it appears above the top line or below the bottom line of a page. These are the places where the shoulder of the types, more exposed than internally on the page, may pick up small amounts of ink from the ink ball, and deposit it when the forme is pressed into the sheet. Wilding noted, and observation confirmed, that in *SNML*, this shoulder ink is deeply impressed, so deeply that raised “mountains” appear at those places on the other side of the leaf. This is evidence for a photographically-derived relief plate, rather than for printing from types. In true type-pages, the shoulders of the type are not at the height of the faces of the letters, but rather are below it. Thus, ink caught on the shoulders of the types will offset onto the printed leaves, but will not press deeply into the leaf. What seemed to be an authenticating feature of *SNML*, its deep “type” impressions, turns out to be a damning feature.

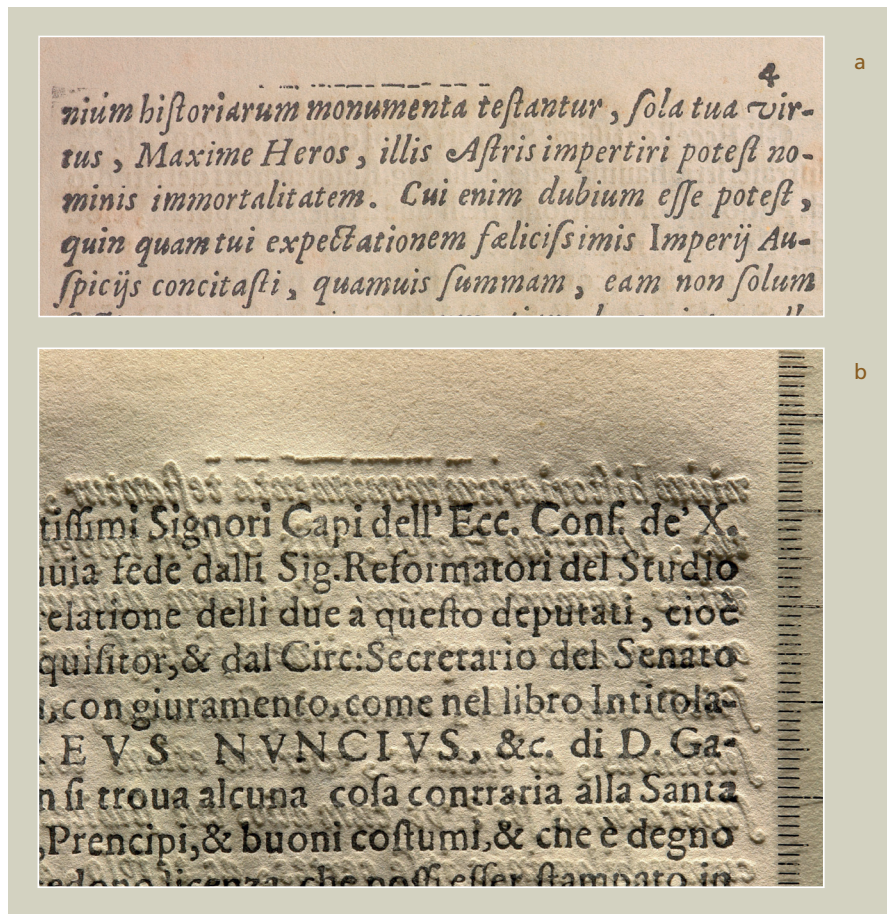


Fig. 1: SNML A4.

a. A4r, inking above the top line.

b. A4v, raised impressions of the inking on A4r.

2. *Distance between adjacent type-pages in the formes.* The *Sidereus nuncius* was printed as a quarto over four-page formes, all locked up tight together. For instance, the outside of sheet B was printed over a forme containing, in one half, pages B1r and 4v side by side with each other, and in the other half pages B2v and 3r, again side by side. For a given forme the distance between the parallel type pages is a constant that cannot vary by more than a fraction of a millimeter, and so that distance is a constant also in the printed copies. In *Galileo Makes a Book*, Needham had calculated this adjacency separation as 54 mm.<sup>1</sup>

In bound copies, this distance can most accurately be measured at the center fold of each gathering, from the right edge of 2v to the left edge of 3r. At Columbia University, using a less than ideal but flexible tape measure, Needham got the following results:

A2v-3r: Columbia, 53 mm – SNML, 48 mm

B2v-3r: Columbia, 54/55 mm – SNML, 48 mm

D3v-4r: Columbia, 52 mm – SNML, 45 mm

And similarly for gatherings E, F and G (since C2v is blank, an equivalent measurement cannot be made). We need not consider this a definite disproof, for one could argue that the

1 *Galileo Makes a Book*, p. 48.

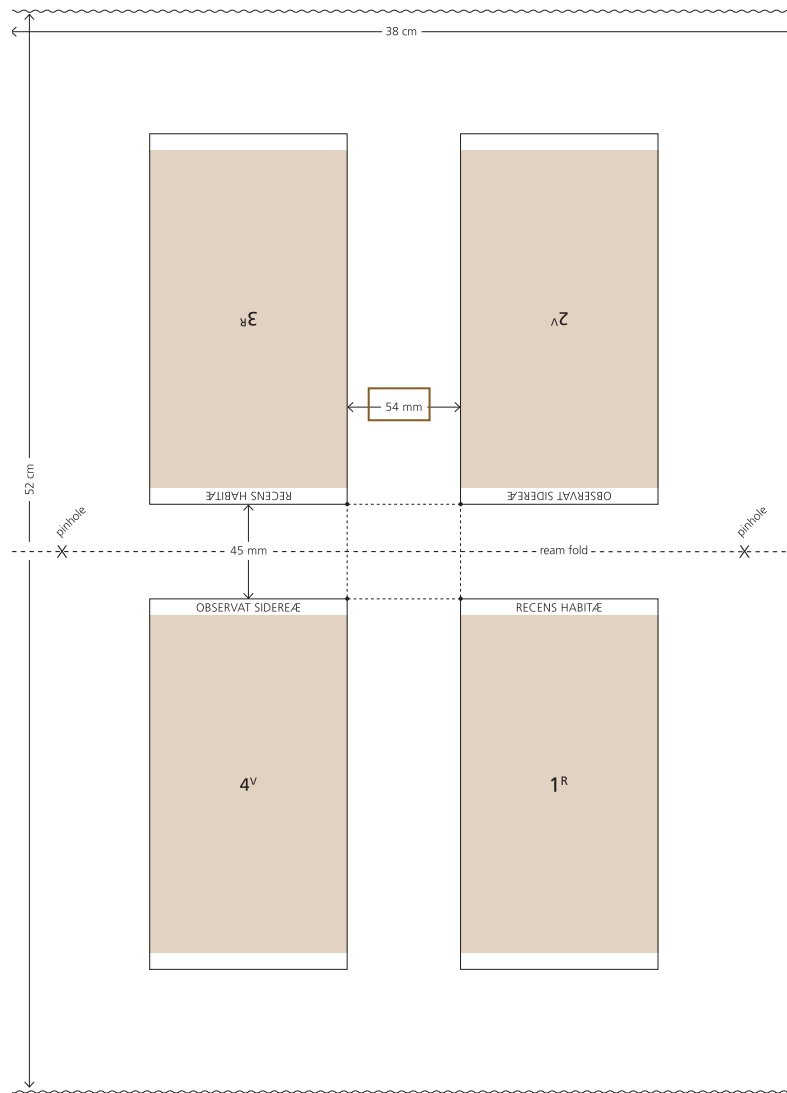


Fig. 2: Placement of pages on the unfolded sheet, and distances separating the pages.

difference in measure reflects a different page imposition of *SNML* (on the hypothesis that it is proof printing). But we cannot be complacent about the consistent difference. If the lost copy of *Sidereus nuncius* offered in the Sotheby's New York auction of 30 November 2005 came back to light, this measurement would be one of the first tests to perform upon it.

3. *The star-diagram woodcuts.* There are two large woodcuts on D5v (full-page) and 6r, showing the stars of the belt and sword of Orion and of the star cluster Pleiades in Taurus. It was noted in *Galileo Makes a Book* that the woodblocks for these star diagrams were cut away, so that each depicted star stands on a little “peg” or mesa, and further that “In various places, the raised pegs were not fully cut around, so that portions of their borders take additional ink.”<sup>2</sup> This extraneous inking was visible in at least two dozen of the “star pegs”

2 *Galileo Makes a Book*, p. 119.

in the Columbia copy, whereas in *SNML*, virtually none of the “star pegs” show border ink. And yet, because the printing impressions of *SNML* are unusually deep and strong, such border ink ought to be all the more visible in that copy. The obvious explanation for the absence of extraneous ink is that *SNML* was printed from photographic plates which had been retouched to remove these visible but unwanted borders of the star pegs.

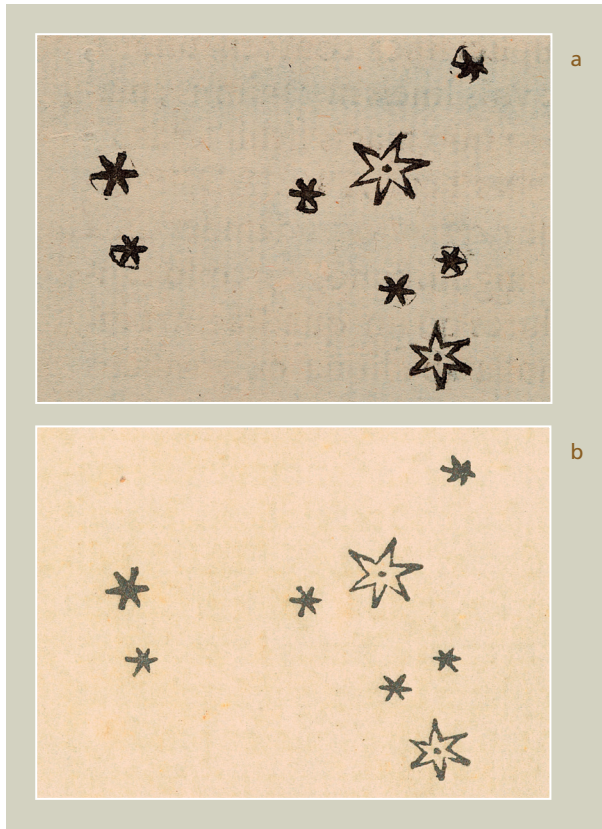


Fig. 3: *Sidereus nuncius*,  
D5v, Orion woodcut  
(detail).

a. Institute for Advanced  
Study copy.

b. *SNML*

4. *Shoulder ink in the Jupiter-moon diagrams.* In gatherings E, F, G there are sixty-five typographic diagrams showing the disposition of Jupiter and its moons on different days and times. Each diagram is made up of a typographic “O” from a large fount to represent Jupiter, and typographic asterisks of up to four different sizes to represent the moons. The spaces between each O and asterisks, indicating relative distance from Jupiter, were created by setting blind spacing quads on the lines. These quads frequently worked themselves up slightly in the forme, so their edges often catch a little ink from the ink ball. Thus, the edges of the theoretically invisible quads may show faintly on the printed page as vertical strokes or brackets. They can be seen in the Columbia copy, the Institute for Advanced Study copy, and many others, probably all. In *SNML* such ink strokes within the diagrams are almost entirely absent, although, as in point 3 above, the deep printing impressions of *SNML* ought to have brought them out rather than suppressed them. Again, the obvious explanation is the removal of such lines by retouching. But one stroke is visible in *SNML* in



the bottom diagram of p. 25r, and here, its push-through, which should not be there at all, is clearly seen on the verso of the leaf. To put the situation in Holmesian terms, it is curious when the dog does not bark in the night, and even more curious that when it does bark, the noise is louder than a dog ought to be capable of producing.

5. *Type impressions in general.* With the *SNML* and Columbia copies set alongside each other, it seemed apparent in many places that the Columbia copy more accurately reproduces the true shapes of the types, while the corresponding impressions in *SNML*, though



Fig. 4: *Sidereus nuncius*, E4r, bottom Jupiter-moon diagram.

a. Institute for Advanced Study copy.

b. *SNML*

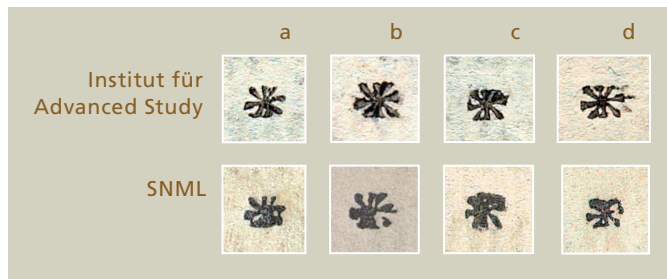


Fig. 5: Asterisk 3 in the Institute for Advanced Study copy and in *SNML*.

a. F3r line 7

b. F4r line 12

c. F4v line 13

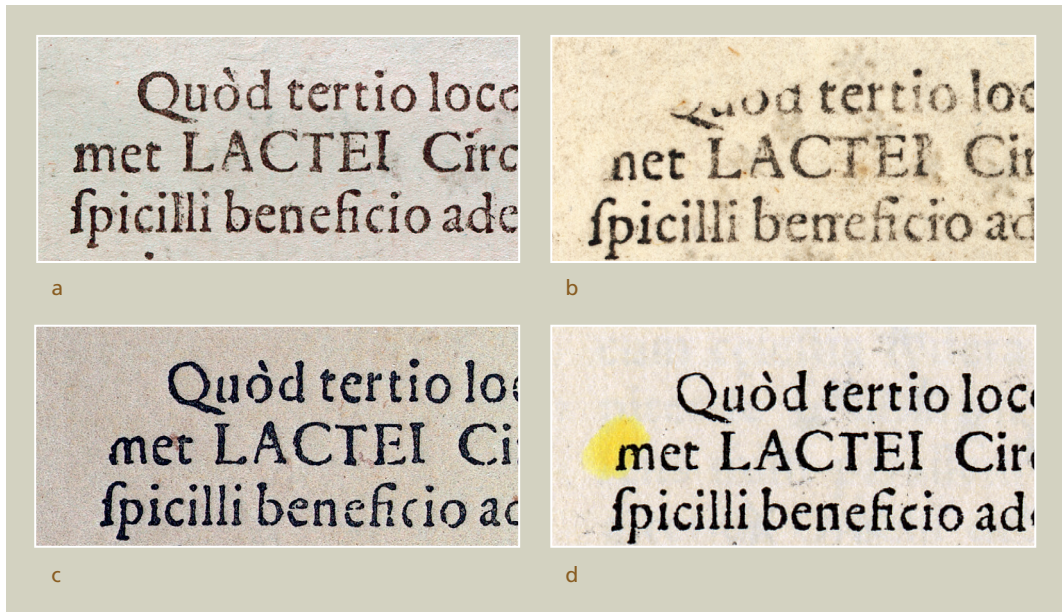
d. G1v line 19

deep, are less sharp, “blobbier.” The best test for this lack of definition in *SNML*’s printing is the character “Asterisk 3” used in many of the Jupiter-moon diagrams. This character was apparently not made by multiple castings based on a single punch, in the manner of conventional type. The characters appear to be a collection of individually filed sorts, each producing, with many small variations, a crude eight-armed star shape.<sup>3</sup> Consistently in the Columbia copy (and others), the eight arms of the star are visible, while in *SNML* the arms run together into shapeless blobs. Yet by Needham’s earlier hypothesis that this is a proof copy, the types in *SNML* should have been here at their cleanest, producing the sharpest images.

3 Galileo *Makes a Book*, p. 136, figure X.11.

Fig. 6: D6r detail

- a. Institute for Advanced Study (no frisket bite)
- b. Linda Hall Library, fine-paper copy (strong frisket bite)
- c. SNML (apparent frisket bite on line 2, but not line 1)
- d. Domus Galilaeana facsimile, 1964 (apparently the source image for SNML)

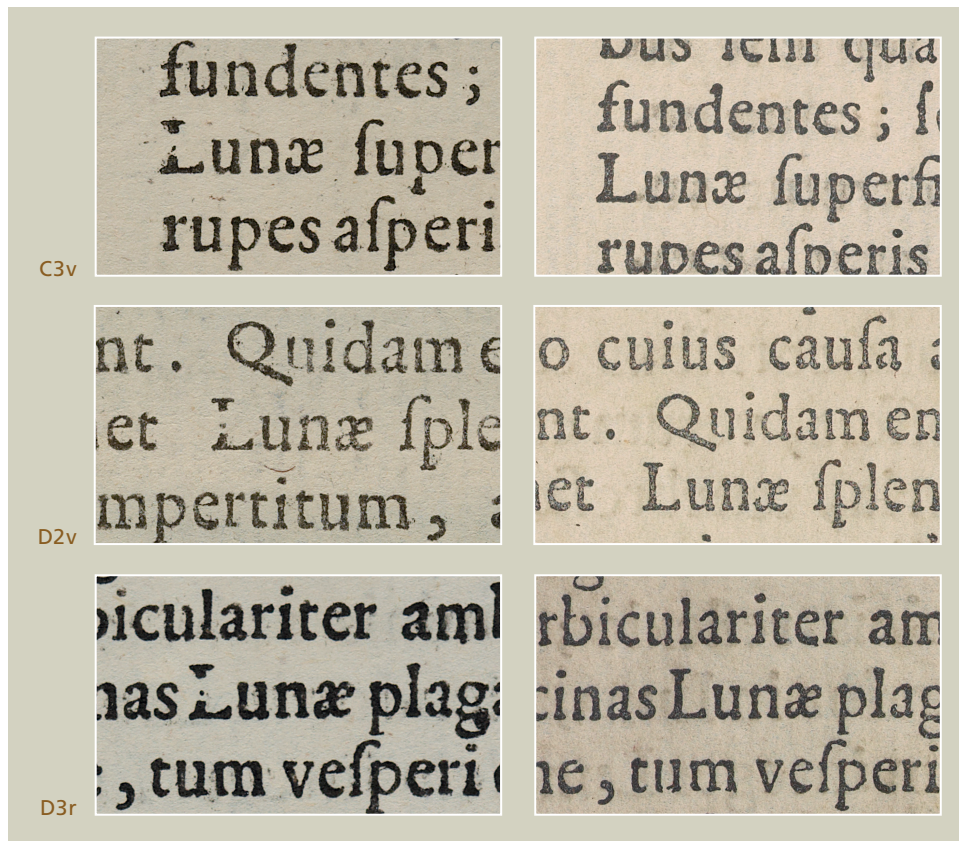


6. *Frisket bite on D6r*. The frisket, made of parchment, was a frame cut closely to the shape of a forme of type, which when laid over the forme in the bed of the printing press prevented extraneous ink on the surface of the forme from printing unwantedly on blank areas of the sheet. Over the course of printing the inner forme of sheet D (D1v, 2r, 5v, 6r) the frisket began to slip, and blocked part of the type page D6r, preventing certain letters from printing cleanly. The slippage began rather late in the print run. Earlier impressions of the sheet show no “frisket bite”, while later ones – including all the fine-paper sheets, printed last – do show the “bite”.<sup>4</sup> The Columbia and Institute for Advanced Study ordinary-paper copies have no frisket bite on D6r. The SNML copy shows a very slight bite, visible in the “m” of the first word on line 2, “met”. As for line 1, its first letter Q does not look impaired in SNML, but this seems to reflect a retouching of the letter to make it seem complete. The appearance of SNML at this place is, in fact, very close to that of the Domus Galilaeana facsimile. But in any case, if SNML were truly a proof copy, printed at the beginning of the print run, it should show no frisket bite at all, and in principle Needham should have noticed this conflict in *Galileo Makes a Book*.

7. *Damaged capital L on pages 11v, 14v, and 15r*. The appearance and reappearance of a single type, a damaged capital L, on these three pages provides the most unambiguous evidence that SNML is a forged copy. The failure to notice this problem is a fundamental flaw in *Galileo Makes a Book*, which analyzed this damaged type.<sup>5</sup> The L-type, with a damaged shaft, was first set on p. 11v (C3v), part of the inner forme of sheet C. Because it is a unique

4 *Galileo Makes a Book*, p. 38, figure III.8, showing frisket slippage in the fine-paper copy at the Linda Hall Library.

5 *Galileo Makes A Book*, pp. 164-165, figure XI.3.



a | b

Fig. 7: Three occurrences of capital L.

a. Institute for Advanced Study copy.

b. SNML.

type, it naturally could not appear on any of the other three pages of that forme, because then it would be in two places at the same time. After the inner forme of sheet C had been printed, its types were cleaned and returned to the typecase, the damaged L going back into the L-box. It was then picked up by the compositor who set p. 14v (D2v), and so it became part of the outer forme of sheet D (D1r, 2v, 5r, 6v). Again, by physical necessity, this L could not appear on any of the other three pages of this forme. After D's outer forme was printed, the damaged L went again into the typecase, and was pulled again by the compositor who set p. 15r (D3r), which became part of the half-forme or two-page forme D3r-4v.

This pattern imposes a strict necessity on *SNML* if we assume it to be a proof copy with its pages printed before the main print run began. On p. 11v, the L could be undamaged in *SNML*, for one could suppose that not until later in the course of printing this forme did the L suffer damage. But there is no way that the damaged L could have “healed” itself before *SNML*'s 14v was printed; then gotten damaged again for the main print run; then healed itself a third time before *SNML*'s 15r was printed; and then gotten damaged a third time. Yet in *SNML* the L seems to print fully, without visible damage, on all three pages. We have stumbled into a “not in this universe” situation. The only explanation with any plausibility is that *SNML* was printed from retouched plates which artificially repaired the damaged L. It is noteworthy that in the *Domus Galilaena* facsimile, this is just what happened: the L looks normal on all three pages.



The conflict of appearance of *SNML* against the Columbia copy was so clear in this matter of the L's that Needham did not understand how he had overlooked it. Only later that evening did he recall what had happened several years earlier. He had realized the strict consequences of the damaged L, and had thought to look at *SNML* at these three places. However, working in New Jersey, he had consulted only a set of relatively low resolution digital images that were on his computer. He saw that in those pictures the L appeared undamaged in all three places, but supposed that the notably heavy inking of *SNML* had covered over the damage, like an impasto; and then forgot, later, to verify this against the original.

And so, as from 31 May 2012, we – Wilding and Needham – felt sure that *SNML* was a forgery. Especially in light of this last point of the damaged L, it was impossible to construct a “path” of alternative explanations, even strained and unlikely ones, that would allow *SNML* to be authentic. Needham informed both Martayan Lan and Horst Bredekamp of our result, and new stages of investigation began. On 11 June 2012 Wilding provided a brief summary of our conclusions on the rare book discussion site ExLibris, with a small addendum by Needham the next day. That site had in the preceding weeks been summarizing developments in the matter of De Caro and the Biblioteca Girolamini, and within the rare book trade generally it had become widely known that De Caro was also the source of *SNML*. It seemed better to make a clear statement than to leave unanswered, behind a veil, the obvious question of the validity of *SNML*.

Martayan Lan continued to be helpful in every way with further explorations of *SNML*. They agreed to send the volume temporarily to Princeton University, where the Library Digital Imaging Manager, Roel Muñoz, made precise digital images of the entire work, to the same standard he had used when photographing the Institute for Advanced Study's copy of *Sidereus nuncius* several years earlier. This allowed for close comparison between the copies of a multitude of small details. For example, each asterisk appearing in the Jupiter-moon diagrams of *SNML* could now be lined up, at significant magnification, alongside its counterpart in the Institute for Advanced Study copy. To Needham's eyes this exercise provided the most striking visual disproof, using a reverse argument, or argument by disproof. If the blobby asterisk shapes of *SNML* are the true reverse images of inked types, how could those same ill-shaped types create also the well-articulated asterisks found in the Institute for Advanced Study copy, and many others?

With the *SNML* volume conveniently in hand, Needham was able to make one more observation which, although it only opened the door on the problem (since handled definitively by Nicholas Pickwoad), served to alleviate a lingering dissatisfaction. One of the subsidiary features of this volume which had seemed to argue for authenticity was that it appeared to sit very comfortably and naturally into its gilt vellum binding, alongside its neighboring Galileo tracts printed in Bologna in the mid-1650s. The ownership stamp was (that is, appeared to be) that of Prince Cesi of Rome, and the tools of the binding independently identify it as Roman, originating in a shop which made bindings for the papacy.<sup>6</sup> The edges of the leaves are gilt and punch-stamped, and under close examination some of those circular punches appear to lie equally over the edges of the *Sidereus nuncius* leaves and those of the following Bologna tract. Several times in preceding years Needham had tried

6 *Galileo Makes a Book*, p. 186 and fig. XIII.14.



to look at the volume with a critical eye, but had failed to notice anything suspicious beyond the likelihood that the endleaves were replaced: not in itself a cause for deep worry for this happens frequently in the life histories of thousands of older bookbindings.

In late June 2012, for the first time, Needham looked closely at the sewing of the volume. It is sewn on three supports and two kettlestitches, making five sewing stations, 1 to 5 from top to bottom. In *Sidereus nuncius*, in all seven gatherings, the sewing thread is taken through each of the five sewing stations. That is, when looking at the sewing in the center of each gathering, one sees four lengths of thread, joining pierced holes made at each sewing station: one length joining 1 and 2; the second, 2 and 3; the third, 3 and 4; and the fourth, 4 and 5. But when the later Bologna tracts are reached in the same volume, the sewing pattern changes, according to pairs of gatherings. In the first gathering of each pair the sewing skips over the third sewing station, going directly, in the center of the gathering, from the second to the fourth. In the second gathering of the pair, the sewing skips over the second and fourth sewing stations, going from the first to the third, and then from the third to the fifth. The Bologna tracts altogether consist of 59 gatherings. All but four steadily follow the pattern just outlined: in the first gathering of a pair, one sewing station is skipped, while in the second of the pair, two sewing stations are skipped. If SNML had been sewn into this binding at the same time as its companions, it ought to have followed the same sewing pattern. Since it does not, we have a strong hint that it is an artificial interpolation.

To summarize: in May and June 2012, Wilding and Needham jointly discovered strong proofs that SNML is not an authentic copy of the first edition of *Sidereus nuncius*. It is, rather, a forgery, made with full intention to deceive. It follows, naturally, that if the SNML copy is a modern fake, all the accompanying features lying on its leaves are likewise modern fakes: the ownership stamp of Prince Cesi, as Wilding had already determined; the moon drawings; the Galileo signature on the title-page; and also, at least in part, the binding. As for the Galileo signature, which to Needham's eye had looked authentic, an explanation of both its apparent rightness and its true wrongness appeared some months later by



Fig. 8: Galileo's signature.  
a. 10 May 1633.  
b. The title-page signature of SNML

pure chance. While browsing through a Vatican exhibition catalogue, Needham spotted the “same” signature.

In the spring and early summer of 1633, brought before the court of the Inquisition in Santa Maria sopra Minerva in Rome, Galileo had at several times been required to subscribe documents of the court, in the form “Io Galileo Galilei ...”, just as we see on the *SNML* title-page. The skilled forger, with sharp eye and agile hand, had followed this model well. But the model is anachronistic. It is the signature not of the forty-six year old man to whose eyes the gates of the heavens had recently begun to swing open, but of the sixty-nine year old, aged and ill and threatened with torture.